Universität für Bodenkultur Wien
University of Natural Resources and Life Sciences, Vienna

Department of Biotechnology
Institute of Bioprocess Sciences and Engineering

Univ. Prof. Dr. rer. nat. Dr.-Ing. Johannes Felix Buyel

To interested Master students
in Biology, Biotechnology and (Bio)Engineering

Vienna, 2023-05-20

Collagen production for 3D tissue culture

Research internship and **Master thesis**
at the **Institute of Bioprocess Sciences and Engineering**
in cooperation with the Institute of Cell and Tissue Culture Technologies

Dear interested Students,

Abstract: Three-dimensional tissue culture has several ground-breaking application potentials including tissue engineering (TE), engineering of therapeutic extracellular vesicles (EVs) and development of more reliable *in vitro* testing platforms. Overall, employment of such 3D strategies like hydrogels aims to recapitulate physiological conditions *in vivo* by providing appropriate biophysical cues und thus creating more favorable environments for cells to expand or differentiate. To achieve them, suitable matrices to build these cultures are dearly needed in large quantities and high quality. In this context, ensuring that the excipients used to create the 3D cultures are free of animal-derived components is important for product safety. Here, we will produce a collagen variant for tissue culture applications in plants and plant cells that are free of animal components and pathogens, purify the protein and subjected it to initial functionality testing. And you can be part of this exciting development.

Your tasks:

1. Clone the coding sequence of the protein into different expression vectors
2. Express collagen in plants and plant cells
3. Extract and purify the protein to a relevant level facilitating initial functionality testing
4. Optional: conduct functionality testing at the Institute of Cell and Tissue Culture Technologies
5. Write a glorious thesis and publication 😊

Duration: The initial internship will take 1-3 months (depending on your availability) and the master thesis will be 6 months. In the course of the project, weekly meetings with your supervisor as well as flexible on-demand meetings and intensive exchange with colleagues will ensure the success of your work.

Requirements: The student successfully applying for this project has good basic knowledge in biotechnology and protein analytics and is keen to gain more insights into innovative plant molecular farming methods in the context of sustainable manufacturing. S/He is skilled in written and spoken English to familiarize herself/himself with the relevant protocols and to fluently communicate within the international environment at IBSE.

Contact: For further questions and applications, please contact Johannes Buyel

Muthgasse 18, 1190 Vienna
T +43 1 476 54-79083
johannes.buyel@boku.ac.at
www.boku.ac.at/dbt/ibse